Fishermen's risk perception: underestimation of risk or coping strategies?

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As this paper still is under preparation, some sections are incomplete.

1 Introduction

" *I was making coffee in the galley when Paul and Peter came down from the deck. Peter began to tell, short of breath and hectic, that they had just 'felt they were alive'. Something with a casing and nearly squeezed fingers. 'What happened exactly? Try to tell more calmly, I asked. But Peter was stopped immediately by Paul: 'No, no, don't tell her! Then she 'll write it all in her computer and there will be lots of troubles out of it!' I never got more to know about what had happened* " (First author's fieldwork notes)

This article originates from an immediate puzzlement under and after some voyages at sea on board fishing vessels. Even though the aim of these voyages was limited to study the fishermen's view on the effects of footwear and flooring on slips, trips and falls, a spinoff of the study was to get an *in situ* insight in the way, fishermen perceived their work and the risks related to it, as well as in the way they perceived a 'tourist'– the terminology used, at least in Denmark, for anyone on board who is not a fisherman.
It is broadly recognised that "sea fishing is the world's most dangerous occupation"(1) and nearly every article quoted in this article begin with an enumeration of studies showing the high rate of accidents occuring in the profession. A majority of them also states that danger is an accepted part of the activity of fishing (2;3) or that risk is somewhat neglected and undercommunicated (4) According to Power (5), it is "largely accepted that certain bodily injury is 'normal' and part of the job" (p. 576). At the same time, it seems that implemention of safety measures in fishery is low and difficult to achieve (6;7). As the introducing quotaton testifies, our own experience confirms that risk is not only accepted, but may also be positively connoted ("feeling one is alive") and that mistrust to outsiders is considerable ("don't tell her") - even though the 'tourist' in question had been on board the vessel in one week and felt quite well integrated in the crew, and even though she had no authority or power to take any action.

In this article, we will reflect upon possible reasons for the acceptability of risk in sea fishing theoretically as well as empirically, and the implications it may have for safety actions and interventions. This is no easy task and we do not intend to find definitive answers – we may even raises more questions, and thereby open up to new discussion**.**

After a brief section on method, we will focus on three salient characteristics of the setting of sea fishing, which we believe are crucial for the fishermen risk perception and attitude to interventions, that is: the risky nature of fishing, the life-mode of small enterprise and the fishermen's sceptical attitude to outsiders. We will then present our approach to risk perception.

2. Method

In order to understand the effect of footwear and flooring on slips, trips and falls (8) four fishing boats were visited. The first author participated in 3 voyages at sea on fishing vessels where interviews and participant observation was undertaken: a ten 10 days trip on an industry trawler

fishing sand eel with a four men crew; a two days trip on a beam trawler fishing shrimps and a one day trip on a set gillnets (trawl) fishing edible fish. these two ships had a two men crew. A fourth fishing boat, a trawler with a three men crew, was visited on dock and the crew interviewed. Based on notes, diary, interviews and photo/video documentation, records related to the fishermen's risk perception were compiled.
Analysing fieldwork notes and diaries, it became obvious that much of it was related not only to the risk of slips, trips and falls, but also to the fishermens' overall risk perception. Even though the empirical base of this presentation is small, it is noticable that only a few works on fishermen are based on fieldwork, which gives a valuable in situ insight. The empirical findings were then analysed by means of theories of risk perception confronted with empirically based research articles on fishermen's risk perception and working conditions in countries comparable to Denmark (industrialised countries).

3. Theory

We are inspired by Eric Hollnagel and his colleages work with resilient engineering, which is a systemic approach to safety research. Morel & Amalberti has written an article about the resilience of fisher skippers, that has been very informing (1). In a matherical-dialectic perspective we use life-mode analysis, as described by Højrup (11), to describe the specificality of fishermen as compared to other ways of organising daily life. In addition we build our understanding of a fishing vessel as a social setting in which the notions of risk and safety is entangled on the work of Douglas & Wildawsky (9)

4. Three clusters of factors affecting risk – a categorisation of the empirical findings

Ropeik and Slovic argue that there are some factors affecting risk perception which, although being subjective and specific for modernity, seems to be very widespread (10). We use their short article as a frame for the presentation and analysis of the empirical findings despite the fact that it is not theoretically well-grounded, but from the pragmatic viewpoint that the value of a theory is not given *a priori*, but is determined by its usefulness (11). Many of the 10 items mentioned by Ropeik and Slovic, seem immediately meaningful, applied to the fishermen's context as described above. We have chosen to retain six of the factors listed and group them in three clusters of related factors.

Man-made or natural risk, old and new risks: the manageability of risk

Ropeik and Sloveik state that we are more aware of man-made risks than of natural ones: "Anthropogenic sources of radiation like nuclear power, mobile phones, or electrical and magnetic fields frequently evoke greater concern than radiation from the sun, which is a vastly greater risk (...) but less worrisome to many because it is natural." (10) As seen previously the roughness of the sea is an important risk factor at sea. It is not only natural, but also as old as the world, which brings us to the next factor: New risks are more frightening than old ones (ibid.) – here Ropeik and Sloveik mention SARS, a risk which today is outdated by A- influenza. The two factors, old/natural, new/man-made are related by the fact that most natural risks are old, but also because old risks and natural risks obviously look difficult to change, and what you cannot change, you have to accept. To the fishermen, many of the risks encountered as classified as natural, thereby inevitable. Then what may seem as underreporting of accidents may in some case be due to another conception of what should be classified as accident. 'Yes, I am all for safety and, knock on wood, I have never

experienced an accident, neither has my crew'. So said a skipper on board his vessel. Half a day later, he told about the time where he fell into the water. Later again he told me how he got his fingers squeezed for a long time ago while operating the anchor, and showed me his two deformed fingers. Another one, deckhand, said: "Compared to how dangerous it is, I don't think there are many accidents".

Control, choice and trust

Ropeik and Sloveik give the following example of how being in control minimise risk awareness: "Having the wheel in your hand gives you the feeling that you can control what happens. But switch to the passenger seat and you're a little more nervous because you are no longer in control." (ibid.) as for choice, "a risk we choose seems less risky than if that risk is imposed on us" (ibid.) control and choice can be considered as two sides of same coin - (the chosen dangers are usually more under control than the imposed ones). The reluctance of the fishermen over external constraints (e.g. regulations) may be explained by a feeling of losing control – a feeling which seems to be justified in some cases: Less than a week after one of the voyage at sea, we got to know through a notice in a fishery periodical that, within a few hours notice, the authorities stopped all sand eel fishing for the season. The ships still at sea had to go back, and the ones ready to leave had to stay home. The life mode of the fishermen and their ideals of independence also explains their stress on being on control

Trust is also important according to Ropeik and Sloveik: the more we trust a person, the less concern we feel about possible risks (ibid.). Trust can be considered ad a transfer of control. What we experienced on board was an enormous trust in one's colleagues – which meant that cooperation often was tacit: "No, we never use walkie-talkie. We use body language " as a deckhand said, and a mistrust in experts of all kinds was salient.

The Risk-Benefit tradeoff

Risk taking and risk prevention is always the result of a trade off (afvejning) and often a compromise.

Several episodes from our field work show that the trade-off of the fishermen had to do with their economic situation in the final analysis. In one of the ship, new antislipping underlay was laid at the cost of the project. The crew and the skipper was very satisfied, so we asked the skipper if he would invest in a anti-slipping underlay, if he should pay for it. 'Yes!', he answered without hesitation. But after a pause, he added: If it is required by the authorities ..." One could nearly hear him weigh the pro and contra of this expense. On a shrimp fishing vessel, we got to know that all vessels of this sort had a voluntary agreement about not exceeding a certain kvota and not fishing in the weekend. It sounded as safe principles, but we got to know later on that the reason for this decision was economic: the price of the shrimp would fall if the stores were too full (private conversation)

Even though economy pays a huge role, which is confirmed by other studies, it would be too simple to reduce the 'benefit' side of the trade off to it.

Time is also important. One has to be ready to catch fish at any time, as we learnt on board – which means that the speed of the meals was very fast, even if we could sit for hours drinking coffee in the mess after lunch.

Social inclusion (sense of belonging) seems to be crucial too : In the four men trawler, the of the crewmembers often stressed how they shared profit and saw each other more than they saw their own family. The 'newest' member of the crew had been working there for 11 years. Bye & Lamvik

(4)mention a fisherman who was teased and called ‘dog’ when he used a safety line. Obviously in this case, the safety line is considered as a metaphor for dependency, and the use of it is might result in exclusion from the community.

5. Analysis: Three characteristics of the profession of fishermen

1) Sea fishing, a risky venture

By its very nature, fishing is unpredictable. There are, at least, two kinds of risks which have to be run in the acticity of sea fishing: economical and environmental risk.
Each tour at sea tour is an economically risky venture, and, as the sea fishing system is economically fragile (1;7), fishermen are highly preoccupied by the risk-benefit trade-off. In a highly interesting study based on simulation observation, Morel et al. shows how production goals were decisive in the fishermen’s decision-making: “From the time they left the harbor, the fishermen never gave up on fishing, even in extreme conditions, and regardless of whether or not the catch was good.”(1). When the condition of the sea was very rough, only one fisherman out of 34, decided to return to port – but it was not because of the weather, but to optimize the sale of his catch, as he figured out that there would be few vessels at the auction (ibid.:10).
The hostile environment of the sea and its unpredictability also contribute to the riskiness of sea fishing – especially when it is combined with a fragile economy, as seen above. Acheson interviewed with 12 fishermen and asked them about which causes they attributed to accidents. Their answers were complex, but the most mentioned category was economic pressure, mentioned by 10. Weather conditions was mentioned by 6, only ‘fate scoring higher (12). Moreover some physical conditions are not easy to controle or improve. For example, the danger of being entangled in gear and rope is difficult to reduce because of the small size of the deck (5).

This unpredictability – of the sea, of the profit, seems to entail some accept of risk (3) Kaplan found that 2/3 of the 22 fishermen he interviewed stated that they were comfortable with the level of risk in their lives (2). Power states that ‘Harvesters in this study largely accepted that certain bodily injury is ‘normal’ and part of the job’(5) :576.

Murray shows that there is more in risk taking than purely economic calculation. In an interview study framed by narrative theory, he shows how most of the fishermen enjoyed their work despite of the dangers (13). “Indeed the very excitement due to theses dangers could be said to contribute to this high level of job satisfaction” (ibid:248) The fisherman’s life, accordingt to Murray, “is one of challenge and independence rather than one of routine and dependence” (ibid.: 249).

2) Small enterprises and a strong self-employed life form

Life-mode theory is a way of analysing differences within a state or society by use of a socio-matherial and dialectic perspective that mainly draws on the work of the philosophers Hegel and Althusser and the linguist Hjemslev. The theory has mainly been advocated by ethnologist Thomas Højrup (14). Højrup argues that within a monocultural state as Denmark several life-modes exist with a fundamentally different way of living and working, each with a set of institutions and organisations promoting their interests. The dominating life-modes are that of salary workers, where life is split between work and leisure time and the career worker, where leisure time is subordinate to work. A life-mode under preassure is that of the self-employed where work is embodied in life in general, meaning that there is no clear distinction between work and leisure time. When the rules and regulations that governs the work life of a self-employed life-mode such as fishermen originates

from a salary worker understanding of life, the regulations tend to counteract with the profound understanding of how life should be for a proper fisherman which mean that the regulations fail to make sense.
Most fishermen today are paid workers, maintaining a strong self-employed life-mode. The flexibility of employment forms, modes of organisation and dividing the profit are in fact a way of retaining the core value, which is the freedom and individuality of the self employed life-mode.

3) Experience-based scepticism toward measures initiated from the outside, gap between expert–knowledge and lay–knowledge

In our approach to risk theories, risk perception is context dependent and socially constructed, and therfore one can expect that it is conceived of in different ways for researchers and fishermen. Risk perception can be considered as a form of knowledge (5), and as such it is hard to imagine bigger gap than between expert scientific knowledge, theoretical, explicit, reproducible, and the lay knowledge, practical, experience-based, embodied and tacit (15-17) – which very much applies for fishermen. As pointed by Power, expert knowledge tends to be hegemonic(5); even if the researcher acknowledges the subjectivity of risk, this hegemony may work at a latent level. Lay perception is then seen as *mis*perception(15), making the risk perceived by experts appearing more 'real' than lay perception. There may be no wonder then, if fishermen are sceptical to safety solutions proposed or imposed by 'hegemonic' experts. There is little doubt that this scepticism is reinforced by the flood of regulations inflicted on them lately. There is no place here to address the relation between safety and regulation, but there seems to be basically the same problem with regulations of all kinds including safety interventions, that they have to be meaningful and compatible with everyday practice to be accepted by the practitioners (2;18;19). Another factor which may affect the perception of outsiders is the strong ties between fishermen, deriving from their particular life-mode as described above. In the name of social acceptability, thus, norms being valid within the community such as freedom or independency may prevale over norms and regulations externally imposed. The fishermen's sense of belonging may influence the trade off risk – benefit too.

6. Discussion

Fishing is paradoxically a complex system. Though the procedure of catching a fish is simple at its core, the context is very complex in its net of actors, regulations, organisational forms and historical practices.

We draw on the following to form an understanding of fishermens risk perception.
. From the tradition of safety research, where the approach mainly has been technical and problem-solving in its focus, stems the concept of resilience which especially Hollnagel has contributed to (20). The concept originated from the physical abilities of a body to restore itself, then psychologists adopted the concept to describe a personal quality. In safety science is describes the quality of a system to imagine, manage and survive risks and their possible consequences. An article by Morel & Amalberti investigates resilience by use of an experiment with fisher skippers because they are believed to be experts in resilience due to their their dangerous and unpredicable task (1). Morel & Amalberti state that 'The activities and professions most frequently exposed to unexpected, critical unbalancing situations are those in which the greatest risks are taken.' This finding is equivalent to our initial puzzlement. The concept of resilience and especially Morel and Amalbertis results on fisher skippers indicate that the risk perception of fishermen is an integrated part of their expertice.

The authors also discuss weather fishermens occupational accidents can be prevented through implementation of more 'constrained safety' measures, such as safety regulations, which is the most often used strategy to improve safety. Morel & Amalberti argue that constrained safety measures, could only be implemented at the cost of 'managed safety' or in other words resilience. Several studies have reported this dilemma between regulations and local expertise (4;6;16;18;21). The dilemma point to an angle that we miss when applying the concept of resilience to the risk perception of fishermen. Namely the socio cultural context of the fishermens work practice. Since resilience describes the safety system of an organisation or a quality of an individual such as a fisher skipper, it does not account for the social context of the fishermens work situation.

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